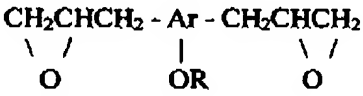
hence a local source of salt and huge volumes of water. The products and processes of the present invention ameliorate if not eliminate some of the disadvantages of prior art of epoxy products and processes.

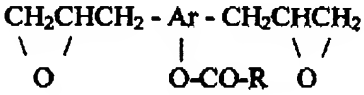
BRIEF DESCRIPTION OF THE INVENTION

(Replaced Paragraph)

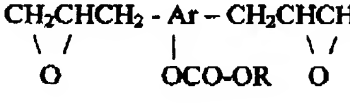
The present invention relates to the preparation of ethers and esters of diallylphenols and the epoxidation of the diallyl moiety to provide bis-epoxide ether and ester intermediates useful in the preparation of epoxy resins. The epoxy ethers and esters of carboxylic, carbonic, phosphoric and sulfuric acids of the present invention are represented by the following formulas:



(I)



(II)



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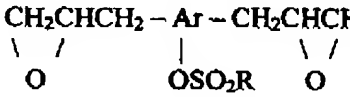

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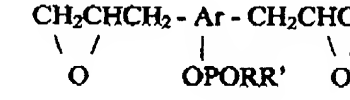

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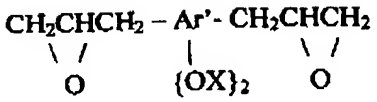

(VI)

where Ar is a trivalent aromatic radical of 6-20 carbon atoms, Ar' is a bridged diaromatic radical having the formula Ar -Y- Ar and Y is O, CO, S, SO_2, $-(CH_2)y$, or $-C(R'')_2-$ and y is from 0 to 6, and R and R' are the same or different alkyl, aryl, alkylene aryl, arylene alkyl, alkylene alkoxy, alkylene aryloxy, arylene alkoxy and arylene aryloxy aryl, radicals having from 6-20 carbon atoms, X is -R, -COR, -COOR, $-SO_2R$, -PORR' and R" is methyl.

DETAILED DESCRIPTION OF THE INVENTION

The synthesis of diepoxides described in the present invention requires the introduction of the allylic moiety to the aromatic ring that is converted in a subsequent reaction to the 2,3-epoxypropyl moiety. The allylation of phenols is well documented in the literature utilizing allyl aryl ethers , that on heating, rearrange to allyl phenols. The reaction is called the Claison Rearrangement (Advanced Organic Chemistry, 3rd Edition, by J. March, John Wiley & Sons 1985). Allyl aryl ethers are readily prepared from the phenate salt and allyl derivatives.

$C_6H_5OH + CH_2=CHCH_2X + base \rightarrow C_6H_5OCH_2CH=CH_2$ where X= chloride, bromide, acetate, tosylate etc.

$C_6H_5OCH_2CH=CH_2 + heat \rightarrow CH_2=CHCH_2-C_6H_5OH$

The preparation of the novel diepoxides described in the present invention utilizes the Claison rearrangement and the allyl ether synthesis in one of two ways depending on the structure of the aromatic substrate. If the starting aromatic is a monophenol, the allylation- rearrangement is carried out a second time to obtain the diallyl product as illustrated below for phenol.

Phenol + allyl chloride + base → allyl phenyl ether

Allylphenyl ether + heat + solvent → 2-allyl phenol

2-allyl phenol + allyl chloride → 2-allyl phenyl ether

hence a local source of salt and huge volumes of water. The products and processes of the present invention ameliorate if not eliminate some of the disadvantages of prior art of epoxy products and processes.

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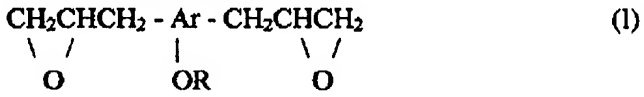
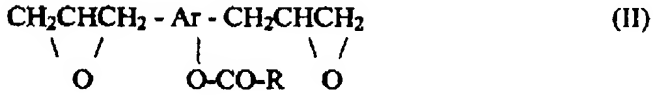


(I)



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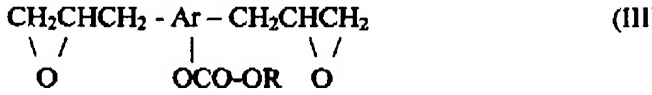

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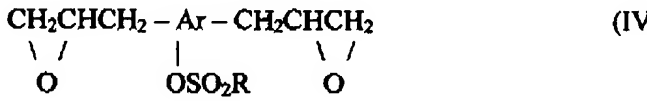

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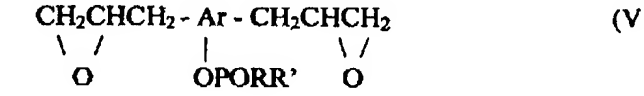
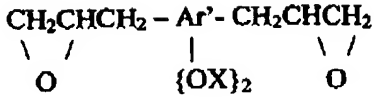


(V)



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